

WHAT IS CLAIMED IS:

1. An apparatus for cutting food product comprising:
an ultrasonic resonant horn; and
a reciprocating cutting tool mounted with respect to the ultrasonic resonant horn, the cutting tool comprising a plurality of longitudinally oriented first cutting blades and a plurality of transversely oriented second cutting blades, each second cutting blade of the plurality of second cutting blades positioned between and connected with adjacent first cutting blades.
2. The apparatus of Claim 1 wherein each second cutting blade is connected to a first end portion of each first cutting blade of the adjacent first cutting blades.
3. The apparatus of Claim 1 wherein the cutting tool comprises an alternating pattern of first cutting blades and second cutting blades.
4. The apparatus of Claim 1 wherein the plurality of first cutting blades and the plurality of second cutting blades form a continuous cutting pattern.
5. The apparatus of Claim 1 wherein each cutting blade has a cutting depth of about 1 mm to about 100 mm.

6. The apparatus of Claim 1 wherein adjacent first cutting blades are positioned at about 3 mm apart to about 100 mm apart.

7. The apparatus of Claim 1 wherein each of the plurality of first cutting blades comprises converging blade surfaces, each blade surface oriented at an angle of about 2° to about 10° with respect to a vertical plane of the first cutting blade.

8. The apparatus of Claim 1 wherein each of the plurality of second cutting blades comprises converging blade surfaces, each blade surface oriented at an angle of about 2° to about 10° with respect to a vertical plane of the second cutting blade.

9. The apparatus of Claim 1 wherein the cutting tool comprises at least two transversely oriented composite blade elements, at least one of the composite blade elements having an open first end.

10. The apparatus of Claim 9 wherein the open first end of the at least one composite blade element abuts a closed end of an adjacent composite blade element.

11. The apparatus of Claim 1 wherein at least a portion of each first cutting blade and at least a portion of each second cutting blade comprises a polished carbide coating.

12. The apparatus of Claim 1 wherein the plurality of food product cubes are substantially identical.

13. The apparatus of Claim 1 wherein the ultrasonic resonant horn has a frequency of at least about 10 KHz.

14. The apparatus of Claim 1 wherein the ultrasonic resonant horn has a frequency range of about 10 KHz to about 40 KHz.

15. The apparatus of Claim 1 further comprising an input conveyor conveying the food product base to the reciprocating cutting tool.

16. The apparatus of Claim 1 wherein at least one of the plurality of longitudinally oriented first cutting blades and the plurality of transversely oriented second cutting blades includes a profiled cutting edge.

17. An apparatus for forming a plurality of food product cubes from a food product base comprising:

an ultrasonic resonant horn; and

a reciprocating cutting tool mounted with respect to the ultrasonic resonant horn, the cutting tool comprising at least two composite blade elements, a first composite blade element of the at least two composite blade elements comprising at least two longitudinally oriented first cutting blades and at least one transversely oriented second cutting blade, each second cutting blade of the at least one second cutting blade positioned between and connected to adjacent first cutting blades, and a second composite blade element of the at least two composite blade elements having an open end and comprising at least one longitudinally oriented first cutting blade and at least one transversely oriented second cutting blade, wherein the second composite blade element open end is adjacent a closed end of the first composite blade element.

18. The apparatus of Claim 17 wherein the at least two composite blade elements are transversely oriented with respect to the food product base.

19. The apparatus of Claim 17 wherein the at least two composite blade elements form a cutting pattern.

20. The apparatus of Claim 19 wherein the cutting pattern is continuous.

21. An apparatus for cutting food product comprising:
an ultrasonic resonant horn; and
a reciprocating cutting tool mounted with respect to the ultrasonic resonant horn, the cutting tool comprising a plurality of longitudinally oriented first cutting blades and a transversely oriented second cutting blade, each first cutting blade of the plurality of first cutting blades positioned along a length of the second cutting blade and connected with respect to the second cutting blade.

22. A method for forming a plurality of food product cubes from a food product base comprising:

forming a food product slab from the food product base;
conveying the food product slab through an apparatus comprising an ultrasonic resonant horn and a reciprocating cutting tool mounted with respect to the ultrasonic resonant horn, the cutting tool comprising a plurality of longitudinally oriented first cutting blades and a plurality of transversely oriented second cutting blades, each second cutting blade of the plurality of second cutting blades positioned between and connected with adjacent first cutting blades;

forming a continuous first cutting pattern in the food product slab;

advancing the food product slab with respect to the cutting tool;
reciprocating the cutting tool; and
forming a continuous second cutting pattern in the food product slab
with respect to the first cutting pattern to form the plurality of food product cubes.

23. The method of Claim 22 wherein the first cutting pattern is transversely oriented with respect to the food product slab.

24. The method of Claim 22 wherein the second cutting pattern is transversely oriented with respect to the food product slab.

25. The method of Claim 22 wherein the continuous first cutting pattern is formed by simultaneously forming a plurality of longitudinally oriented slits in the food product slab and forming a plurality of transversely oriented cuts in the food product slab between adjacent slits.

26. The method of Claim 22 wherein the first cutting pattern and at least a portion of the second cutting pattern form a row of food product cubes.

27. The method of Claim 22 wherein an upstream portion of the second cutting pattern contacts a downstream portion of the first cutting pattern to form a row of food product cubes.